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POLICY RECOMMENDATION FOR THE UNITED STATES REGARDING THE WEAPONIZATION OF SPACE

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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Maxwell Air Force Base, Alabama

March 2010

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Introduction

Picture this scenario: The year is 2025 and control of Kashmir is again at the forefront of international politics. Rivers and tributaries that feed northern India and Pakistan originate in Kashmir adding to the complexity and importance of this long-disputed territory. Population growth in both Pakistan and India has strained water resources and so stalemate is not an option for Pakistan this time. Their militaries have traded company-sized conventional skirmish victories, but Pakistan is determined to win the decades old conflict with its much larger neighbor and help relieve water scarcity for the agrarian countryside. Having developed space-based weaponry with China's funding and technical aid, Pakistan destroys two critical Indian intelligence and imagery satellites hours before launching a ground attack. This sends the Indian military leadership searching for battlefield situational awareness, and in the fog and friction the Pakistanis achieve a tactical victory benefitted of the element of surprise. This strategic statement on the use of space weapons in a modern conflict is no small step in the history of warfare. Determining that a nuclear response is not warranted or prudent, India retaliates to this international embarrassment and conflict escalation by employing kinetic weapons from space, placed in orbit five years prior. China feels threatened and offers to aid the Pakistanis while mobilizing troops on its own Kashmir border. How fantastic is this narrative? Could this play out in a mere fifteen years?

In the forty-eight years since Russia accomplished the first manned space flight in 1961, space exploration has come a long way. The space shuttle program in the United States and the annual budgets of the National Aeronautics and Space Administration (NASA) and Department of Defense (DoD) for space highlight the lasting importance of space exploration from not only a scientific inquiry standpoint, but also from a security perspective from the world's only current

superpower. NASA's budget for FY2010 was $18.7 billion and increases to $19.0 billion for FY2011 in the first year of a plan to spend $100 billion through FY2015.[1] Exact numbers for current DoD spending on space is difficult to discern due to the classification of many systems, but $22.0 billion was spent in 2008, and President Obama has encouraged space program expansion and modernization since taking office. Technologies developed in the pursuit of space have benefited both military scientists and civilian consumers. Commercial benefits to space exploration include satellite television, phone, radio, and internet capabilities; the Global Positioning System (GPS) for navigation; and advances in metallurgy, textiles, heat-resistant materials, nutrition, and medicine. Space exploration is not likely to slow down in the near term despite the worldwide recession; of the sixty-seven space administrations worldwide, no fewer than eleven are capable of launching satellites, and four of the eleven are capable of supporting manned spaceflights.

Despite its importance, space is not actually defined by the small body of international law that governs it. None of the United Nations (UN) treaties or conventions specifically express what space is. This may be because a defined point at which airspace ends and space begins would put a measurable vertical limit on a given state's sovereign territory.[2] For obvious reasons, states are reluctant to clearly define this. Technology often determines what international laws govern a particular object, the distinction between an extremely high flying aircraft or a satellite in an extremely low orbit determines what laws govern its employment. The common understanding of space is the three dimensional area surrounding the earth's atmosphere (which extends approximately one-hundred kilometers above the surface of the earth). Practically, it begins with low earth orbits at 200 kilometers above the earth surface and extends to limits set only by technology. Weaponization of space refers to the act of placing

weapons in space to be employed against other space objects, land targets, or objects transiting the earth's atmosphere, whereas the militarization of space is the use of space for military operations such as imagery, intelligence, communications, weather, and surveillance. Weaponization includes kinetic and non-kinetic systems that destroy or disrupt objects or functionality.

The debate on militarization or the military exploitation of space has been ongoing for years. In the 1980s, President Reagan's Strategic Defense Initiative (SDI) shifted the Department of Defense's focus away from the mutually assured destruction framework of the Cold War towards a more defensive posture with a theoretical capability to destroy nuclear ballistic missiles before they entered US airspace with space-based weapons. Since its inception in 1983, the SDI has been renamed on occasion, signaling the changing focus and objective of space-based weapons systems.[3] Although it is impossible to compile actual spending totals across the complete spectrum of space-based defense programs, the United States invested well over $60 billion on SDI and follow on programs through 2000 when ballistic missile defense emphasis turned away from space based assets to terrestrially based missile interceptors.[4] The eventual derivative of SDI is today's Missile Defense Agency, reflecting a broader approach to the mission and still holds a commanding lead over all current or potential future adversaries in the realm of space technology and warfare. The vast majority of this investment has been in basic research in the fields of high-energy physics, supercomputing and computation research, advanced materials, and many other critical science and engineering disciplines. Today, space related defense research and testing remains heavily budgeted.

Having mastered the sea with surface ships and submarines, and the air with remotely piloted aircraft (RPAs), stealth fighters, and intercontinental strategic bombers, it is only logical

that the next step in our defense posture is to tackle space, the ultimate high ground, from which no enemy can establish an advantageous position. Space dominance would give the United States a marked advantage in cyberwarfare with the ability to destroy sophisticated adversaries' communications and intelligence satellites while defending our own. This would be a greater advantage than the enhanced ability to hold targets anywhere on earth at risk with little or no warning that space weaponization also offers. Space-based weapons disadvantages include cost, maintenance, and threat of over-reliance. Also, many of the capabilities space based weapons offer are available more cheaply from terrestrially based weapons systems. What should the United States' policy be with respect to the weaponization of space? Should the United States pursue and ratify an international treaty limiting or banning the use of space weapons? Or should the United States pursue space weapons unilaterally? Is there a middle ground, and if so, what is it? Having surveyed the advantages and disadvantages of US participation in a space ban treaty, it is clear that the security goals of the future dictate that the US pursue an international treaty codifying and restricting space weapons.

Current and Potential Situations around the World

Currently the United States has the most integrated satellite network in space, which is to say that although it can gain the most from space exploitation, it also has the most to lose should space assets be lost to anti-satellite technology. On 5 May 2009, the US Missile Defense Agency announced it launched yet another satellite.[5] The Space Tracking and Surveillance System Advanced Technology Risk Reduction satellite is a forerunner to a future system of space-based missile sensors. The planned technology will be capable of passing continuous tracking data back to the wider US missile defense system quickly enough to enable interceptors to bring down a strategic missile. Just how many of these types of satellites are in space is not published.

The United States has also deployed a Space Surveillance Network satellite which detects, tracks, identifies, and catalogs all space objects in case it finds it "necessary to disrupt, degrade, deny, or destroy enemy space capabilities in future conflicts."[6] These space objects are the roughly 8500 objects 10 centimeters or larger that orbit Earth including approximately 600 operational satellites, 1300 rocket bodies, and 6600 inactive satellites or other space debris.[7] In addition to these defense-oriented satellites, the US Air Force also hosts the GPS satellite constellation, whose accuracy was designed for military use of precision weapons before becoming a consumer product for commercial use. The potential exists to weaponize space with offensive jamming satellites, denying the use of GPS, satellite communications, and surveillance to other nations, and anti-satellite weapons ranging from space-based lasers to space-based kinetic energy weapons.

Russia is the second leading space presence with respect to military use although this may change in coming years with China's and India's surging space programs. The Russian Space Forces is a branch of the Armed Forces of the Russian Federation and responsible for military space operations. Established in 1992 following the breakup of the Soviet Union, the organization shares control of the Baikonur Cosmodrome with the Russian Federal Space Agency. It also operates the Plesetsk and Svobodny Cosmodromes. (A cosmodrome is a Russian space launch facility.) Among other things, the Russian Space Forces are responsible for ballistic missile defense and the creation, deployment, maintenance, and control of space vehicles including the GLONASS global navigation and positioning system. The current technology and budget of the Space Forces does not make any offensive space weapons likely in the near future. Last year they announced that a private firm would be contracted RUB800 million (approximately $24 million) to design a Soyuz manned space vehicle replacement by

June 2010.[8] The first manned flight is planned for 2018. If Russia has space weaponization aspirations, its resources preclude development. Current US systems ensure space dominance relative to Russia without the requirement of advanced weaponization. The same may not be true of other states.

China has an active space program and this has caused concern for US security. In January 2007, they demonstrated the capability to employ a direct assent anti-satellite weapon by destroying an old weather satellite. One can only assume the last three years since that launch has seen more anti-satellite weapons development outside the international public eye. Having developed their military to target their potential adversaries' weaknesses, the Chinese recognize the United States' reliance on space for intelligence, targeting, and communications. Not only are they interested in winning an "informationalized" war, for which they would need offensive anti-space weapons, but they are also interested in deterring increased United States use of space. In September 2008, Bruce MacDonald, Senior Director of the bipartisan Congressional Commission on the Strategic Posture of the United States wrote that

> Chinese specialists have stated that, in addition to protecting their satellites and US offensive capabilities, China will develop a deterrent space force if there is no change in US space policy, which they see as shunning any restrictions and reflecting US attraction to space dominance. They have suggested that China would be prepared to deploy sufficient offensive counterspace capability to build confidence in its ability to deter US use of weapons against Chinese space assets.[9]

MacDonald goes on to state that these anti-space weapons of the Chinese are more likely to be earth-based rather than space-based, but that space weaponization is not out of the realm of possibility.

Chinese interest in space research is being exported as well. Pakistan will be the beneficiary of $222 million worth of Chinese space development and research in coming years

culminating with Pakistani satellite launches commencing in 2011.[10] Now a member of the nuclear club, Pakistan has set its sights on the international respect garnered by space power.

Pakistan's greatest threat and adversary, India is also surging its space exploration and development. The Indian space program has evolved since the first forays into space research in 1962 and recently has fielded many dual-use (commercial and military) technologies.[11] The commercial market for space launch services has blossomed in India, spurring rocket development and research as well as diversifying India's space partners which include Belarus, Israel, Russia, Canada, and the United Kingdom (UK).[12] China's anti-satellite demonstration sparked renewed collaboration between the India Space Research Organization and the Defense Research and Development Organization. It is likely that a new space race between India, Pakistan, and China is beginning with little US political weight available to curb the phenomena.

Current International Law

Beginning in 1957 with Russia's launching of Sputnik, states began discussing systems to ensure the peaceful use of outer space. Bilateral discussions between the United States and Union of Soviet Socialist Republics (USSR) in 1958 resulted in the presentation of issues to the UN for debate. In 1959 the UN created the Committee on the Peaceful Uses of Outer Space (COPUOS). COPUOS in turn created two subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee. The COPUOS Legal Subcommittee has been a primary forum for discussion and negotiation of international agreements relating to outer space.

In 1967, the US, UK, and the USSR signed the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*[13], also known as *The Outer Space Treaty*. Since then it has been ratified by ninety-nine states world-wide, and signed by an additional twenty-six awaiting ratification. This

document has become the basis for international law as it relates to outer space. Article I states that any exploration and use of outer space "shall be carried out for the benefit and interests of all countries."[14] One interpretation of this would be that all military uses are banned while a less stringent interpretation would allow some peaceful military use of space. This has been the customary thinking worldwide as many nations use space for military applications.[15] Article IV of the treaty provides that states party to it will not place nuclear weapons or any other kinds of weapons of mass destruction on celestial bodies or in outer space. Interestingly, it does not prohibit conventional weapons in space. Arguments against conventional weapons in space focus on the non-peaceful intentions of pursuing a program as the treaty does not specifically address non-nuclear weapons.

Other treaty articles underscore the notion that space is no single country's domain and that all countries have a right to explore it. Space should be accessible to all countries and can be freely and scientifically investigated according to Article I. Exemption of space and celestial bodies from national claims of ownership or sovereignty is in Article II. Article IX states that countries are to avoid contaminating and harming space or celestial bodies and Article VII says that countries exploring space are responsible and liable for any damage their activities may cause. Space exploration is to be guided by "principles of cooperation and mutual assistance," such as obliging astronauts to provide aid to one another if needed (Article V).

Since the Outer Space Treaty was enacted, several other treaties have attempted to further develop space law. The 1972 *Convention on International Liability for Damage Caused by Space Objects* known as the Liability Convention held that a state is liable for damages caused by space objects that were launched from that state, regardless of the owner of the space object, its purpose, or the time in orbit.[16] Under this treaty, Australia made a claim against the United

States for littering in the amount of $400 for Skylab crashing in Western Australia in 1979.[17] The 1975 *Convention on Registration of Objects Launched Into Outer Space* or Registration Convention requires states to furnish the UN with details about the orbit of each space object launched from within their territory. A registry of launchings was already being maintained by the UN, but the convention gave such a registry more legitimacy. With the devastating effects on other space objects that even small pieces of space debris can have, it is imperative that the registry be enforced and accurately maintained. Finally, the 1979 *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* or Moon Treaty was an attempt by the international community to ensure that jurisdiction of all heavenly bodies (including the orbits around such bodies) is given to the international community vice specific states. Thus, all activities must conform to international law (notably this includes the UN Charter). Unfortunately, according to the UN Office for Outer Space Affairs, none of the thirteen states that have ratified the treaty engage in self-launched manned space exploration of have plans to do so. Although enacted in 1984, the treaty is a failed enterprise since it does not have any credibility or legitimacy except in theoretical discussions and has had a negligible effect, if any, on actual spaceflight.

Possible Courses of Action

There are three general avenues the United States can pursue with respect to the international community, a possible arms race in outer space, and national security interests in space exploration and exploitation. The US can take a neutral, isolationist approach; it can actively work against treaty development; or it can seek to be a leader in the international discussion. Each is discussed, highlighting the advantages and disadvantages.

First, the United States can remain neutral in any discussions in the UN General Assembly or Security Council or any other international forum. By not voicing an opinion and abstaining from official statements the US may be better able to survey and assess the international community's attitude toward weapons in space prior to developing an official policy. Employing its massive budget relative to the other space agencies, the United States would explore and exploit space to the limits of the Outer Space Treaty unencumbered by the pressure and expectations of international community leadership, leaving countries like China and India even further lagging in space development. Like the Moon Treaty, any international agreement would lack US backing, and so would fail to limit the United States pursuit of hegemony in space as well as other space-faring nations.

This strategy, however attractive also has disadvantages for enduring national security. Without an American voice at the table, international opinion could easily become wary of US programs or worse yet, hostile toward US national security. The United States would have little to no say in regulatory initiatives which could prove to be a liability in the long run. Given the massive expense incurred by space exploration, defying an international resolution with continued space weaponry development and the political soft power associated with such defiance would be the only alternative to bowing to international pressure and scrapping costly programs. It is also likely that nations with the means will follow the perceived weaponization in space that the United States will have pioneered. With no US signature on any treaties, and weak, if any, enforcement measures, voluntary adherence will be minimal, driven by lack of resources and not good faith in space law. Although remaining neutral has its advantages, it could prove to be a politically costly course of action.

Another policy would be to take an active anti-treaty position. In international conventions and discussions the United States would impede and prevent any treaties limiting the weaponization of space. Should such treaties pass despite the United States' best efforts, they would not be signed by the administration or ratified by the Senate. Such a stance would be a continuation of President George W. Bush's policy which generally opposed international accords that might tie the nation's hands in space. The National Space Policy issued by the Bush White House in 2006 states that the "United States will oppose the development of new legal regimes or other restrictions that seek to prohibit or limit US access to or use of space."[18] This position certainly insulates the United States from any interference from other nations and purports to put no limits on the development of space technology. President Barrack Obama has done nothing to change this current policy. The United States would continue to be the hegemon in space with international rhetoric to back it up. The main advantage in this course of action is the unabashed willingness to develop the space frontier, putting the rest of the world on guard. In the short term this may contribute to national security, but with a time horizon stretching decades, it could jeopardize the near-monopoly in space the United States currently enjoys.

Already there are indications of China's willingness to expend capital to build a deterrent space force if the United States does not change its policy, and India has been quietly building its own space programs. With such an uncooperative policy, the United States may draw fire from other nations, and possibly from its own current allies, notably the UK and the European Space Agency members. The international political arena is often too fragile to take such a staunch position. Positioned far beyond neutrality, the United States would certainly be alienated from space governance discussions and decisions, possibly rising to the level of being targeted by them as a rogue space state. With no space allies, the financial burden or economies of scale in

expensive production of space vehicles and materials would not be realized either, possibly slowing space exploitation more than if a softer line were taken internationally.

The third approach calls for the United States to soften its current policy, and reestablish itself as the leader is space, not only of space technology and exploration, but also of a movement to develop the relatively immature body of space law. This position has several advantages. As a soft power strategy, this policy will strengthen existing relationships with space exploration and foster new cooperative efforts. Advocating new governance customs for space would show the rest of the space-faring nations that the United States has the betterment of mankind at heart with respect to space exploration. Pursuing and ratifying treaties limiting space weaponization would also allow the United States to guide the future of space law with national interests in mind. Space exploration and exploitation would not be hindered as long as the United States shapes the direction and language of international agreements. Given the sheer volume of US satellites in low earth orbit and annual expenditures in pursuit of space exploration, it would be logical to expect a sizable US presence on governing councils, inspection teams, and other bodies of governance with any treaties. This would obviously be an advantage for the United States if for no other reason to keep it at the forefront of space law.

There are some disadvantages to this open policy toward international space cooperation. Treaty discussions could lead to unwanted limits on US programs preventable only by either US bullying prior to the final vote on the treaty or by failure to ratify it thereby rendering it non-binding on US space operations. Being party to a treaty will most likely require periodic inspections of US programs and technologies. Such audits and inspections may not be in the best interest of US national security and there might be little ability to prevent technology lead to other nations or prosecute those responsible.

Recommendation

The United States should pursue the third course of action. By advocating and ratifying a treaties limiting space weaponization, the United States would best position itself to ensure national interests and security are preserved.

While policies of neutrality and non-cooperation with the international community may offer a more permissive environment for unfettered space development, the political and economic price is too high as a long term national space strategy. Unilateral operations have served the United States well over the last several years in terms of freedom of action and maneuver, but the political environment in 2010, along with emerging terrestrial threats to national security, requires the United States to take on a more cooperative approach to many foreign policy issues, space governance included.

The objective of a carefully executed space strategy will be cooperative engagement with the international community with the United States acting as the leader in space exploration and governance. The current skeletal body of space law will be expanded with concrete language, avoiding ambiguous verbiage that can lead to wide interpretation differences. Through cooperation and active engagement, US national interests will be protected and possibly furthered with space allies sharing resources, funding, intellectual property, and other essentials required for space development. Technological innovation will not be stifled, but positively vectored in a direction consistent with international norms, and US interests.

Concessions made to prevailing international attitudes with respect to space weapons will be mitigated by US guidance and leadership. Carefully executed, a soft power space strategy could result in an international regime built around the US space program's desires, reflecting US national security interests. First, the United States needs to determine what the national

space policy will be with respect to militarization of space and the addition of space weapons. Many factors will come into play including cost, lethality, survivability, maintainability, and the advantage over adversaries required to ensure space dominance in a conflict. Once this basic framework has been established, the US diplomatic corps can push for a treaty that complements the national space policy. One of the stipulations should be permanent presence on any audit or inspection teams, as well as membership on governing councils or committees.

Conclusion

The significant developments in space exploration in the last fifty years have not been reflected in international space law. Just as benefits of space exploration have been realized in many fields including medicine, nutrition, metallurgy, textiles, and consumer products; military applications have advanced as well around the world and cannot be ignored. Today, weapons technology makes space a viable staging arena for not only defensive but offensive systems. With this in mind, and the efforts around the world to increase presence in and exploitation of space, the United States should actively pursue a treaty codifying and restricting space weapons in accordance with a coherent national space policy. An active policy of leadership through engagement, consensus building through diplomacy, and carefully crafted control measures, should result in a clearly defined treaty advantageous to US national interests and sustainable for decades to come.

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